

METHOD, SYSTEM, AND COMPUTER PROGRAM PRODUCT FOR  
REPRESENTING OBJECT RELATIONSHIPS IN A  
MULTIDIMENSIONAL SPACE

ABSTRACT

A method, system, and computer product is presented for mapping a set of patterns into an  $m$ -dimensional space so as to preserve relationships that may exist between these patterns. A subset of the input patterns is chosen and mapped into the  $m$ -dimensional space using an iterative nonlinear mapping process based on subset refinements. A set of  $n$  attributes are determined for each pattern, and one or more neural networks or other supervised machine learning techniques are then trained in accordance with the mapping produced by the iterative process. Additional input patterns not in the subset are mapped into the  $m$ -dimensional space by determining their  $n$  input attributes and using the neural networks in a feed-forward (prediction) mode.